

FOUR NEW SPECIES OF CTENOPHTHALMUS (SIPHONAPTERA)

BY

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***Ctenophthalmus bifidatus* sp. nov.**

(Figs. 1—3)

Type material: Male holotype from Abant, Bolu province, Turkey, 4500 ft., from *Microtus guentheri guentheri*, 9.VIII.1953; female allotype from same locality, 14.VIII.1953, from a mouse; 1 ♀ paratype, same locality, 9.VIII.1953, mouse; 1 ♀ paratype, 3 miles north of Abant, 4000 ft., 12.VIII.1953, mouse; 1 ♂ paratype, 8 miles north of Abant, 3500 ft., 13.VIII.1953, mouse; 1 ♂ paratype, Abant, 14.VIII.1953, mouse; 1 ♂ paratype, same locality, 4500 ft., 15.VIII.1953, mouse; 1 ♀ paratype, 3 miles north of Abant, 4000 ft., 16.VIII.1953, rodent; 1 ♂ paratype, Sapanca, Bolu province, 500 ft., 6.VIII.1953, rodent. All collected by Dr. H. H. HOOGSTRAAL of the U.S. Naval Medical Research Unit. Holotype and allotype in the U.S. National Museum, Washington, D.C.; paratypes in the collection of Lt. Col. R. Traub and in the British Museum collection of fleas at Tring.

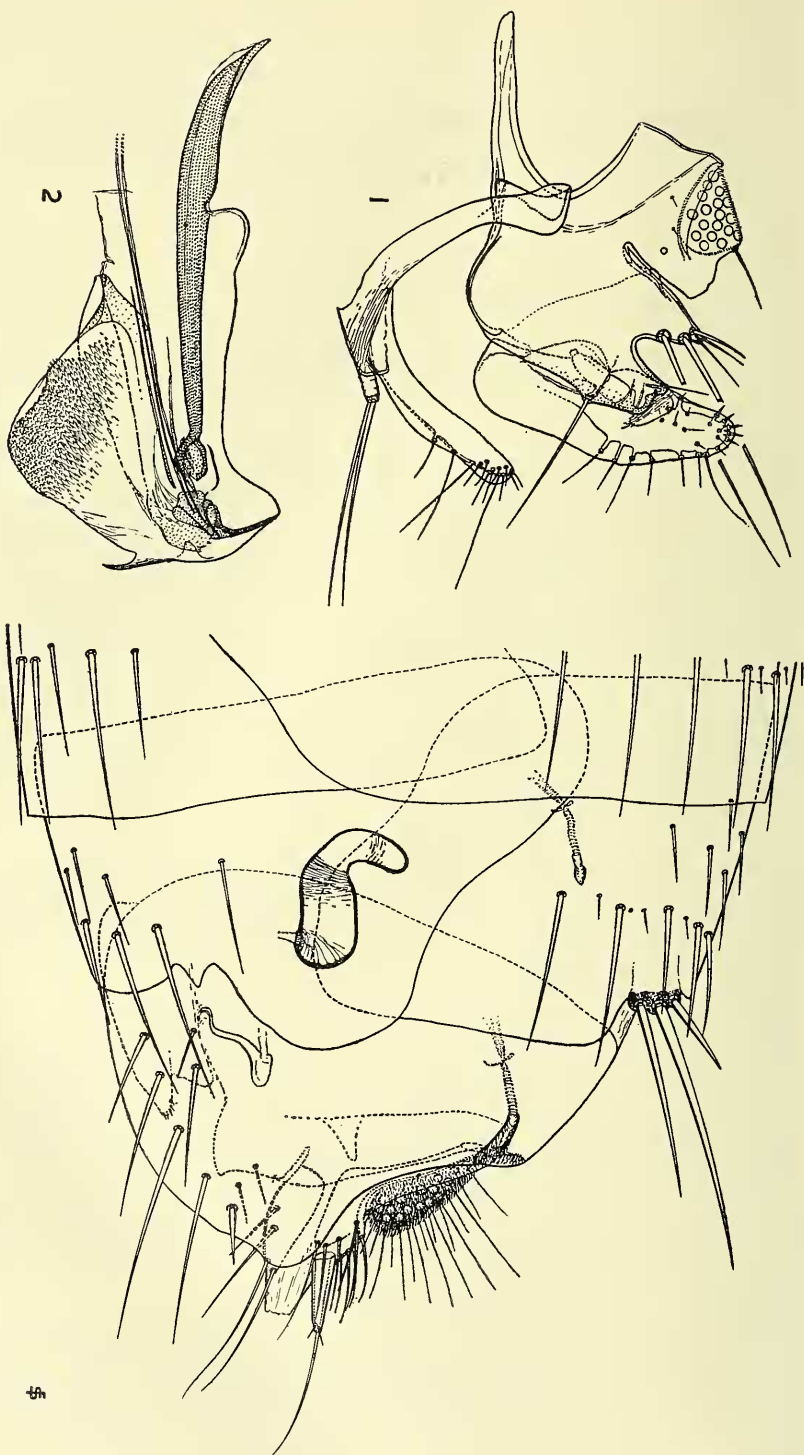
Diagnosis: This remarkable new species is a member of the *agyrtes*-group of species of *Ctenophthalmus*, apparently nearest related to *C. andorrensis* Smit, and is easily distinguished in the male from any other species of the genus by the bifurcate distal arm of sternum IX; the female can hardly be differentiated from that of *C. andorrensis*.

Description: Head, thorax, legs and unmodified abdominal segments virtually as in related species.

Male (Figs. 1, 2): Sternum VIII with a broadly rounded posterior margin and ventrally a group of 7—11 setae. Clasper (Fig. 1) strongly resembling that of *C. agyrtes* s.l. and especially that of *C. andorrensis*, but the lower half of the movable process is much narrower. The structure of sternum IX is unique in the genus since the distal arm of each side is bifurcate; the upper long branch, being homologous with the normal distal arm, is rather narrow, with a blunt apex, and bears a few long and very thin setae and a number of much shorter ones; the lower branch is short and bears two very long setae.

Phallosome (Fig. 2) reminiscent of that of *C. andorrensis*, but the ventral lamella is densely set with minute scales, the most dorsal of which are teat-like.

Female (Fig. 3): Posterior margin of sternum VII with a small triangular lobe below the large rounded dorsal lobe. In other respects, also, the female ter-



Figs. 1—3. *Ctenophthalmus bifidatus* sp. nov. 1. Clasper and sternum IX (paratype, from Abant); 2. Phallosome (paratype, from Abant); 3. Terminal abdominal segments and genitalia of female allotype

minial abdominal segments and genitalia are extremely like those of *C. andorrensis* and other related species.

Length: ♂ 2—2 $\frac{1}{4}$ mm, ♀ 2 $\frac{1}{2}$ —2 $\frac{3}{4}$ mm.

Ctenophthalmus capriciosus sp. nov.

(Figs. 4—7)

Type material: Male holotype and female allotype from the Babuna Planina (about 15 km north of Prilep), Macedonia, Yugoslavia, from *Clethrionomys glareolus*, 15.VII.1934, V. Martino don. Holotype and allotype in the British Museum collection of fleas in the Zoological Museum at Tring.

Diagnosis: A member of the *agrytes*-group of species of *Ctenophthalmus*. The male is very distinct and can be differentiated from related forms by the dorso-posterior outgrowth of sternum VIII and by the two subspiniform setae on the apex of the distal arm of sternum IX. The female can be distinguished from females of *C. agrytes* s.l. by the shape of sternum VII, though some females of *C. bisoctodentatus* may have a similar sternum VII.

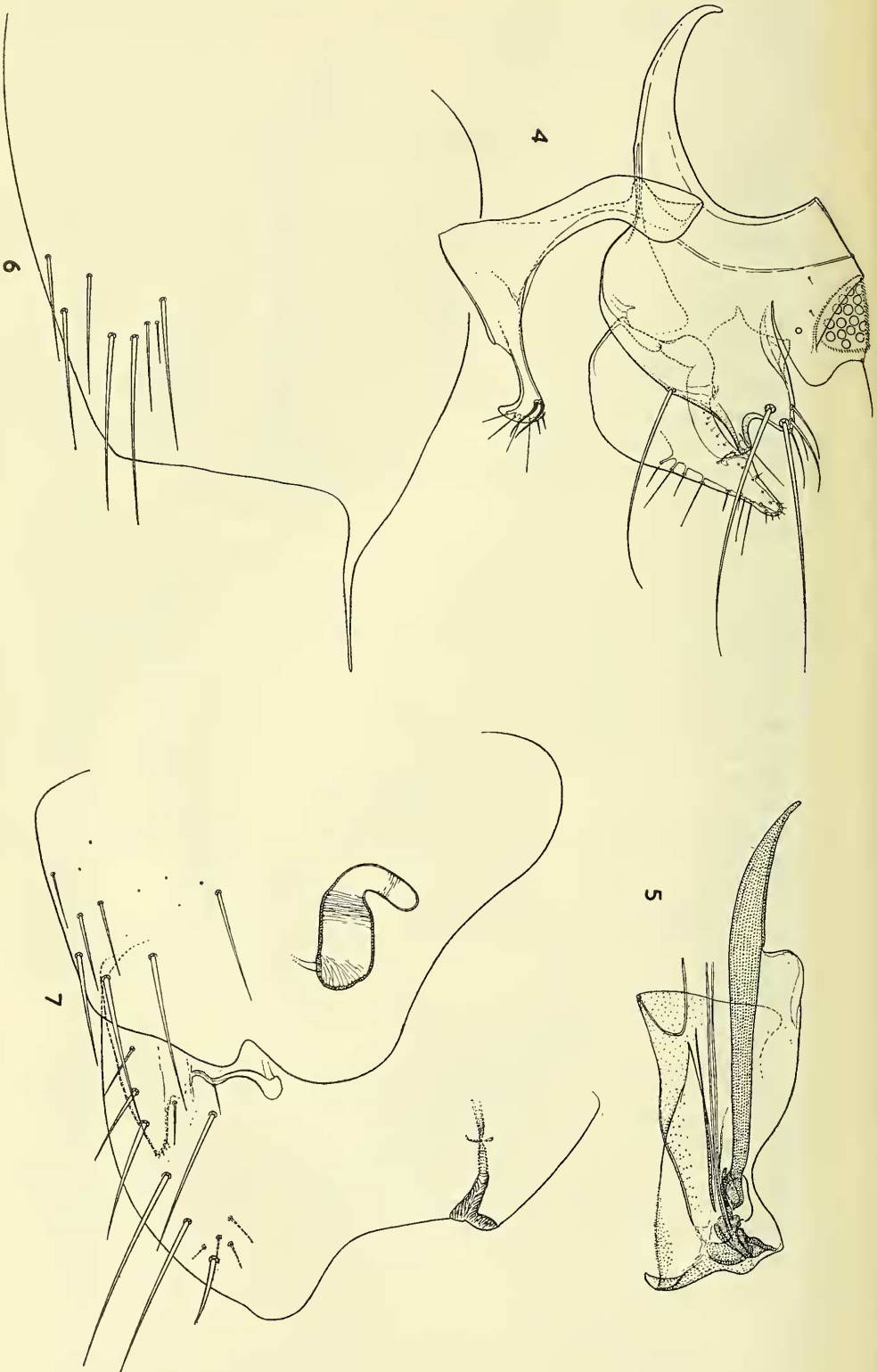
Description: Head, thorax, legs and unmodified abdominal segments as in *C. agrytes* s.l.

Male (Figs. 4—6): Dorso-posterior angle of sternum VIII (Fig. 6) drawn out into a long and narrow projection, below which the posterior margin is straight. Dorsal lobe of fixed process of clasper (Fig. 4) triangular, with two long setae, and several shorter ones dorsally; the ventral lobe, separated from the dorsal one by a fairly deep sinus, is very narrow with a short straight apical margin; the long acetabular seta is placed rather far below the apex of the ventral lobe. Movable process elongate pyriform, tapering gradually towards the narrow apex. Five extremely small sensilla at the apex of the movable process; the group of four setae, which are not placed close together, in the middle of the posterior margin; fovea elongate, rather small. Manubrium curved upwards, with an up-turned tip. Apical third of distal arm of sternum IX (Fig. 4) narrow, while the apex forms a downward extension; two of the apical setae are curved and subspiniform. Phallosome (Fig. 5) without ventral aedeagal lobes.

Female (Fig. 7): Posterior margin of sternum VII divided by a sinus into a largish rounded dorsal lobe and an oblique and rather high lower lobe. Tergum VIII with four small genital setae; no setae above the spiracular fossa. Sternum VIII fairly broad. Spermatheca as in related forms, see Fig. 7.

Length: ♂ 2 $\frac{1}{2}$ mm, ♀ 2 $\frac{3}{4}$ mm.

Remark: The structure of sternum VIII and sternum IX of the male is so peculiar that the specimen could be believed to be a freak. However, the symmetry of the two sides of the holotype is perfect and there is nothing to suggest that the specimen is a monstrosity. Within a group of rather uniform species one may find one or a few species which, in certain characteristics, are most unlike all other members of the group; *Ctenophthalmus bifidatus*, described in this paper, is another good example of a species which has "gone mad" in certain respects.



Figs. 4—7. *Clenophthalmus capriciosus* sp. nov. 4. Clasper and sternum IX (holotype); 5. Phallosome (holotype); 6. Sternum VIII (holotype). 7. Sternum VIII, segment VIII and genitalia (allotype).

***Ctenophthalmus tertius* sp. nov.**

(Figs. 8—11)

Type material: Male holotype from Mt. Tonkoui, near Man, Ivory Coast, 800—1200 m, 20—30.IX.1946, from the nest of a murid rodent, A. VILLIERS leg. Holotype in the British Museum collection of fleas in the Zoological Museum at Tring.

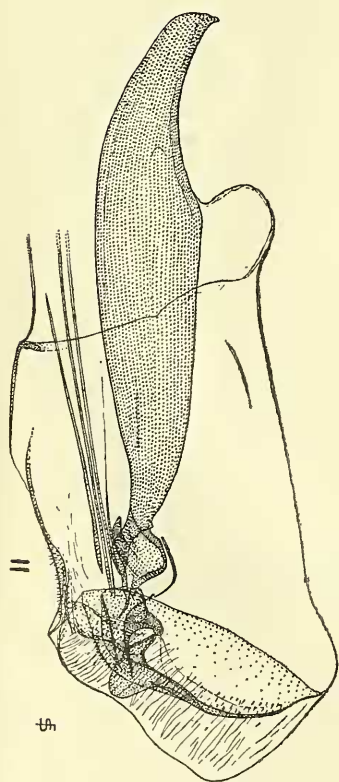
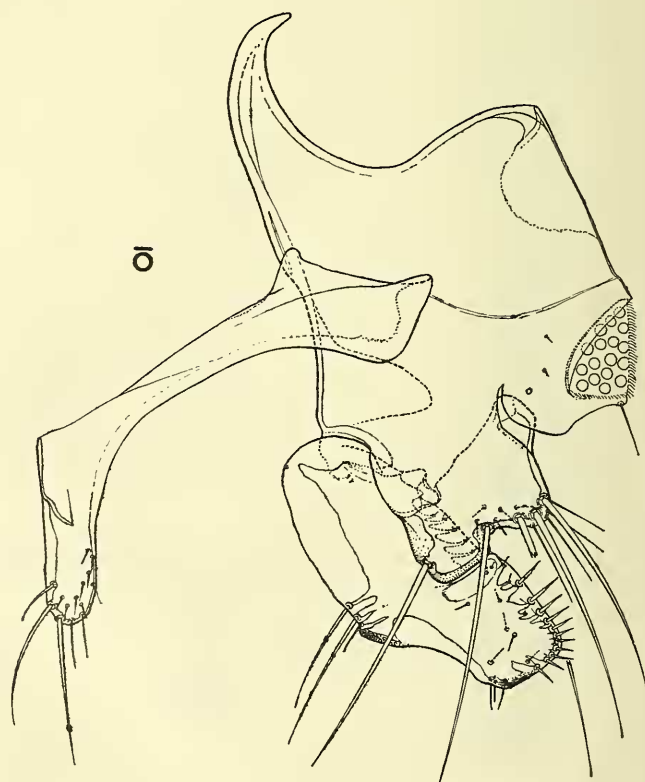
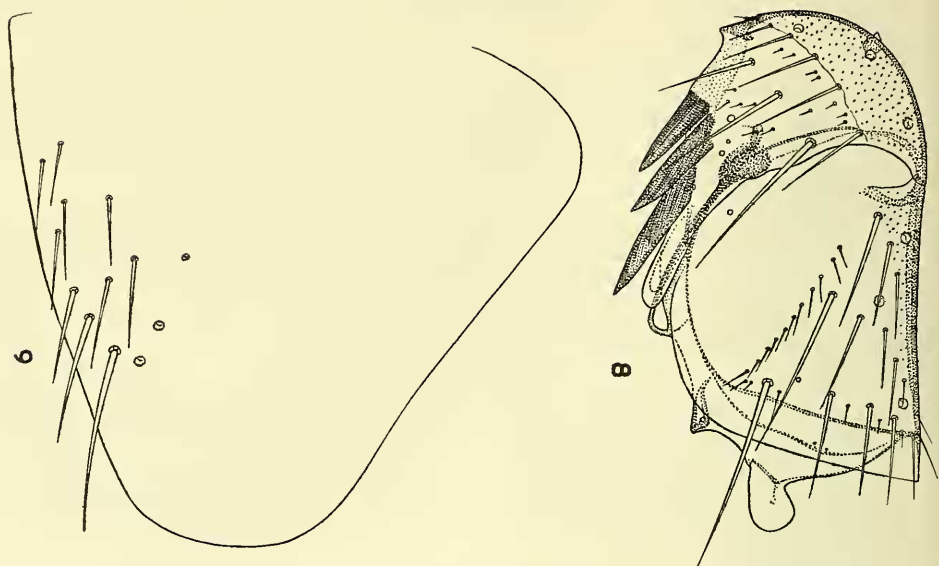
Diagnosis: The new species is the third member of the group of West African species which hitherto consisted of *C. acunus* Jordan, 1929 (from Nigeria) and *C. moratus* Jordan, 1926 (from Ghana), and can be distinguished from the latter two species by the structure of the modified abdominal segments and of the phallosome. Female unknown.

Description: Frons (Fig. 8) with a notch a short distance above the oral angle in which a very small seta, the first of the frontal row of six setae, is situated; this notch is present only in the *moratus*-group of *Ctenophthalmus*. Labial palp reaching just beyond the middle of the fore coxa (in the other two species to two-thirds the length of the fore coxa). In other respects the head, thorax, legs and unmodified abdominal segments resemble those of the two related species.

Male (Figs. 9—11): Anterior to the spiracular fossa of tergum VIII are 4 or 5 short setae. Sternum VIII with a rounded posterior margin and a strongly sloping dorsal margin (Fig. 9). Apodeme of tergum IX (Fig. 10) dorso-anteriorly with a well developed interior sclerotic area; corpus of clasper ventro-apically with a large triangular interior sclerotization. Fixed process of clasper (Fig. 10) with a broad but little projecting lower lobe and, apart from the strong acetabular seta, with four long and several shorter setae along the dorso-posterior margin. Movable process of clasper straight and broad, widest in the middle, with a broadly truncate apex; inner surface of movable process smooth; along the anterior margin and anterior half of the apical margin a row of 10—11 basiconiform sensilla; fovea large, bean-shaped; the group of setae along the posterior margin (usually four in most members of the genus) is placed just below the middle of the margin and consists of two fairly large and one small setae. Along the posterior half of the apical margin the movable process is more strongly sclerotized, while there is also an elongate marginal sclerotization immediately above the group of three setae in the middle of the posterior margin. Distal arm of sternum IX (Fig. 10) only half as long as the proximal arm, fairly narrow, with a rounded apex which bears a number of small setae as well as two large setae and a medium-sized one ventrally.

Phallosome as shown in Fig. 11; the aedeagal apodeme is relatively very broad, while the lateral wall of the aedeagus is dorsally much expanded and the dorso-apical aedeagal sclerite very long.

Length ♂: 3 mm.



Figs. 8—11. *Glenophthalmus tertius* sp. nov. 8. Head (antenna omitted) (holotype); 9. Sternum VIII (holotype); 10. Clasper and sternum IX (holotype); 11. Phallosome (holotype)

***Ctenophthalmus arcanus* sp. nov.**

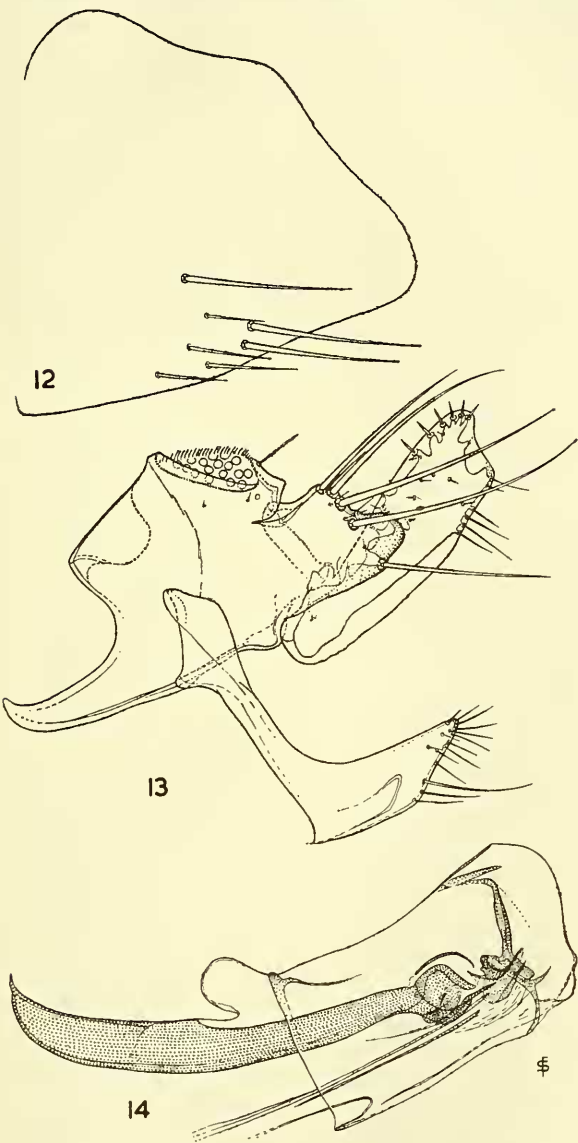
(Figs. 12—14)

Type material: Male holotype from Mt. Soque, 42 km W.S.W. of Luimbale, Angola, from *Rattus* sp., 22—25.VIII.1954, G. HEINRICH. The

specimen, which I have been able to study and describe through the kindness of Lt. Col. R. Traub, is in the collection of the Chicago Natural History Museum.

Diagnosis: The relationships of this new species with other Ethiopian species are difficult to assess but apparently *C. arcanus* is nearest related to *C. phyrus* Jordan, *C. devignati* Jordan, *C. smithersi* de Meillon and *C. vanhoofi* Berteaux. The male is easily distinguishable from any other African *Ctenophthalmus* by the elongate movable process of the clasper with its drawn-out dorso-anterior angle, and by the structure of the phallosome.

Description: Eye fairly well-developed but not very dark. Spines of genal ctenidium sharply pointed, the middle of the three the broadest, the posterior one the longest. Labial palp reaching to two thirds the length of the fore coxa. Pronotal ctenidium consisting of 16 spines which are distinctly longer than the



Figs. 12—14. *Ctenophthalmus arcanus* sp. nov. 12. Sternum VIII (holotype); 13. Clasper and sternum IX (holotype); 14. Phallosome (holotype).

pronotum. Longest seta of second hind tarsal segment not reaching the apex of the third segment. Last hind tarsal segment with three pairs of lateral plantar

setae. One subdorsal marginal spinelet on each side of terga I—IV.

Male (Figs. 12—14): Anterior to the spiracular fossa of tergum VIII are 4 short setae. Sternum VIII as in Fig. 12. Apodeme of tergum IX (Fig. 13) dorso-anteriorly with a well developed interior sclerotic area; corpus of clasper ventro-apically virtually without an inner sclerotization. Fixed process of clasper (Fig. 13) with a rather broadly rounded projecting lower lobe and, apart from the acetabular seta, with four long and several shorter setae along the dorso-posterior margin. Movable process of clasper elongate, $3\frac{1}{2}$ times as long as apically broad, with a projecting dorso-anterior angle; inner surface of movable process smooth; along the apical part of the anterior margin of this process are six rather small basiconiform sensilla; fovea elongate, fairly indistinct; the group of four setae along the posterior margin placed a short distance below the dorso-posterior angle, which is more strongly sclerotized than the rest of the free part of the movable process. Distal arm of sternum IX (Fig. 13) about two-thirds the length of the proximal arm, broad and almost trapezoid; along the straight oblique apical margin one longish and a number of short setae. Phallosome as in Fig. 14.

Length: ♂ $2\frac{1}{4}$ mm.